the control signal comprises a step of adjusting an amplitude and a phase of the input signal based on second control signal of the plurality of control signals.

23. (Once Amended) A method for reducing distortion in a transmitter having a feed forward amplifier comprising steps of:

receiving an input signal;

amplifying the input signal to produce an amplified signal;

determining an error signal based on the input signal and the amplified signal;

amplifying the error signal to produce an amplified error signal, wherein the amplified error signal comprises an error component and a distortion component; and

producing a control signal based on the distortion component of the amplified error signal, wherein the control signal is capable of controlling an adjustment of an amplitude of the input signal and a phase of the input signal and, by controlling an adjustment of the input signal, controlling the distortion component of the amplified error signal.

## REMARKS

In an Office Action dated July 2, 2002, (paper no. 5) the Examiner objected to claims 4 and 12 due to informalities. The Examiner rejected claims 1-4, 10-12, 18-20, 23, and 24 under 35 U.S.C. §102(e) as being anticipated by Ghannouchi et al. (U.S. patent no. 6,275,105, hereinafter referred to as "Ghannouchi"). The Examiner objected to claims 5-9, 13-17, 21, 22, and 25 as being dependent upon a rejected base claim but as being allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The rejections and objections are traversed and reconsideration is hereby respectfully requested.

Claims 1 and 10 have been amended to provide the limitations of a control circuit that receives a portion of the error signal, detects a peak power of the received portion of the error signal, and produces a control signal based on the detected peak power, wherein the control signal is capable of controlling an adjustment of an amplitude of the input

signal and a phase of the input signal, and, by controlling an adjustment of the input signal, controlling the error signal distortion component. These limitations are not taught by Ghannouchi. The control circuit taught by Ghannouchi in FIG. 3, that is, elements (38), (35), (32), and (37), control an adjustment of an error signal, not an input signal applied to the main amplifier. And the detector (23) taught by Ghannouchi in FIG. 1 that controls an adjustment of the input signal is merely a diode detector, not a peak power detector. Furthermore, the diode detector (23) and controller (11) taught by Ghannouchi in FIG. 1 are designed to eliminate the error signal altogether and, unlike the control circuit of claims 1 and 10, are not designed to reduce distortion introduced to the error signal by the error amplifier. Therefore, nowhere does Ghannouchi teach the limitations of claims 1 and 10 of a control circuit that detects a peak power of a portion of the error signal and produces a control signal based on the detected peak power, wherein the control signal is capable of controlling an adjustment of an amplitude of the input signal and a phase of the input signal and, by controlling an adjustment of the input signal, controlling the error signal distortion component. Accordingly, the applicants respectfully request that claims 1 and 10 may now be passed to allowance.

Since claims 3, 4, and 7-9 depend upon allowable claim 1 and claims 11 and 12 depend upon allowable claim 10, the applicants respectfully request that claims 3, 4, 7-9, 11, and 12 may now be passed to allowance.

Claim 18 has been amended to provide limitations of detecting a peak power of the error signal and producing a control signal based on the detected peak power of the error signal, wherein the control signal is capable of controlling an adjustment of an amplitude of the input signal and a phase of the input signal, and by controlling an adjustment of the input signal, controlling the distortion component of the amplified error signal. As noted above, these limitations are not taught by Ghannouchi. Accordingly, the applicants respectfully request that claim 18 may now be passed to allowance.

Since claims 19 and 20 depend upon allowable claim 18, the applicants respectfully request that claims 19 and 20 may now be passed to allowance.

Claim 23 has been amended to provide the limitations of producing a control signal based on the distortion component of the amplified error signal, wherein the control signal is capable of controlling an adjustment of an amplitude of the input signal and a phase of the input signal and, by controlling an adjustment of the input signal, controlling the distortion component of the amplified error signal. As noted above, the control circuit taught by Ghannouchi in FIG. 3, that is, elements (38), (35), (32), and (37), control an adjustment of an error signal, not an input signal applied to the main amplifier. Accordingly, the applicants respectfully request that claim 23 may now be passed to allowance.

Since claims 24 and 25 depend upon allowable claim 23, the applicants respectfully request that claims 24 and 25 may now be passed to allowance.

Claims 5, 13, and 21 were objected to by the Examiner as being dependent upon a rejected base claim but as being allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. In accordance with the Examiner's objections, the applicants have rewritten each of claims 5, 13, and 21 in independent form to include all of the limitations of the base claim and any intervening claims. Accordingly, the applicants respectfully request that claims 5, 13, and 21 may now be passed to allowance.

Since claim 6 depends upon allowable claim 5, claims 14-17 depend upon allowable claim 13, and claim 22 depends upon allowable claim 21, the applicants respectfully request that claims 6, 14-17, and 22 may now be passed to allowance.

The applicants have amended each of claims 4 and 12 to correct various informalities. The applicants have also amended each of claims 14-16 and 22 to provide proper antecedent support.

As the applicants have overcome all substantive rejections and objections given by the Examiner and have complied with all requests properly presented by the Examiner, the applicants contend that this Amendment, with the above discussion, overcomes the Examiner's objections to and rejections of the pending claims. Therefore, the applicants

respectfully solicit allowance of the application. If the Examiner is of the opinion that any issues regarding the status of the claims remain after this response, the Examiner is invited to contact the undersigned representative to expedite resolution of the matter.

Respectfully submitted,

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## Version with Markings to Show Changes Made

1. (Once Amended) In a feed forward amplifier that receives an input signal and amplifies the input signal to produce an amplified signal, wherein the feed forward amplifier determines an error signal based on the input signal and the amplified signal, wherein the feed forward amplifier amplifies the error signal to produce an amplified error signal, and wherein the amplified error signal comprises an error component and an error signal distortion component, an apparatus for correcting distortion in the amplified error signal comprising:

a control circuit that receives a portion of the error signal, detects a peak power of the received portion of the error signal, and produces a control signal based on the [received portion of the error signal] detected peak power, wherein the control signal is capable of controlling an adjustment of an amplitude of the input signal and a phase of the input signal, and, by controlling an adjustment of the input signal, controlling [an energy of a peak power of the error signal; and

wherein, by controlling the energy of the peak power of the error signal,] the error signal distortion component [can be reduced].

2. Cancelled.

4. (Once Amended) The apparatus of claim 3, wherein the control circuit comprises:

a peak power detector that detects an energy of a peak power of the error signal;

a controller coupled to the peak power detector that produces the control signal based on the detected energy; and

wherein the control signal is capable of controlling an adjustment of an amplitude of the input signal and a phase of the input signal.

5. (Once Amended) [The apparatus of claim 1, wherein the] In a feed forward amplifier that receives an input signal and amplifies the input signal to produce an amplified signal, wherein the feed forward amplifier determines an error signal based on the input signal and the amplified signal, wherein the feed forward amplifier amplifies the error signal to produce an amplified error signal, and wherein the amplified error signal comprises an

error component and an error signal distortion component, an apparatus for correcting distortion in the amplified error signal comprising:

a control circuit that receives a portion of the error signal, receives a portion of the amplified error signal, [and] produces an error distortion signal based on the received portion of the error signal and the received portion of the amplified error signal, wherein the error distortion signal comprises a distortion component of the received portion of the amplified error signal, wherein the control circuit further quantifies the error distortion signal[, and wherein the control circuit] produces [the] a control signal based on the quantified error distortion signal; and

wherein the control signal is capable of controlling an adjustment of an amplitude of the input signal and a phase of the input signal, and wherein, by controlling an adjustment of the input signal, controlling the error signal distortion component.

10. (Once Amended) A [communication device having a transmitter that comprises] feed forward amplifier comprising:

a main signal path that receives an input signal, samples the input signal to produce an attenuated input signal, conveys the attenuated input signal to a feed forward correction circuit, amplifies the input signal to produce an amplified signal that comprises a distortion component, samples the amplified signal to produce an attenuated amplified signal, and conveys the attenuated amplified signal to the feed forward correction circuit;

a feed forward correction circuit coupled to main signal path that receives the attenuated input signal and the attenuated amplified signal from the main signal path, produces an error signal based on the attenuated input signal and the attenuated amplified signal, amplifies the error signal to produce an amplified error signal that comprises an error component and a distortion component, samples the error signal to produce an attenuated error signal, and conveys the attenuated error signal to a control circuit;

a control circuit coupled to each of the main signal path and the feed forward correction circuit that receives the attenuated error signal from the feed forward correction circuit, detects a peak power of the attenuated error signal, produces a control signal based the [attenuated error signal] detected peak power, and conveys the control signal to the main signal path; and

wherein, based on the control signal, the main signal path adjusts an amplitude and a phase of the input signal in order to control an energy of a peak power of the error signal and reduce the distortion component of the amplified error signal.

11. (Once Amended) The [communication device] feed forward amplifier of claim 10, wherein the control circuit further detects an energy of the attenuated error signal and produces the control signal based on the detected energy.

12. (Once Amended) The [communication device] feed forward amplifier of claim 11, wherein the control circuit comprises:

a power detector that detects an energy the attenuated error signal; and

a controller coupled to the [peak] power detector that produces the control signal based on the detected energy of the peak power of the of the portion of the error signal.

13. (Once Amended) [The communication device of claim 10, wherein the] A feed forward amplifier comprising:

a main signal path that receives an input signal, samples the input signal to produce an attenuated input signal, conveys the attenuated input signal to a feed forward correction circuit, amplifies the input signal to produce an amplified signal that comprises a distortion component, samples the amplified signal to produce an attenuated amplified signal, and conveys the attenuated amplified signal to the feed forward correction circuit;

a feed forward correction circuit coupled to main signal path that receives the attenuated input signal and the attenuated amplified signal from the main signal path, produces an error signal based on the attenuated input signal and the attenuated amplified signal, amplifies the error signal to produce an amplified error signal that comprises an error component and a distortion component, samples the error signal to produce an attenuated error signal, [further] samples the amplified error signal to produce an attenuated amplified error signal, and conveys the attenuated error signal and the attenuated amplified error signal to [the] a control circuit[,];

[wherein the] a control circuit coupled to each of the main signal path and the feed forward correction circuit that [further] receives the attenuated error signal and the

attenuated error signal from the feed forward correction circuit, [and] produces an error distortion signal based on the attenuated error signal and the attenuated amplified error signal, wherein the error distortion signal comprises a distortion component of the attenuated amplified error signal, [wherein the control circuit further] quantifies the error distortion signal to produce a quantified error distortion signal, [and wherein the control circuit] produces [the] a control signal based the quantified error distortion signal, and conveys the control signal to the main signal path; and

wherein, based on the control signal, the main signal path adjusts an amplitude and a phase of the input signal in order to control an energy of a peak power of the error signal and reduce the distortion component of the amplified error signal.

14. (Once Amended) The [communication device] feed forward amplifier of claim 13, wherein the control signal comprises a plurality of control signals, wherein the control circuit produces the error amplifier distortion signal by combining the attenuated error signal with the attenuated amplified error signal, wherein prior to combining the signals and based on a first control signal of the plurality of control signals, the control circuit adjusts an amplitude and a phase of the attenuated error signal in order to facilitate a cancellation of an error component of the attenuated amplified error signal, and wherein the control circuit conveys a second control signal of the plurality of control signals to the main signal path.

15. (Once Amended) The [communication device] feed forward amplifier of claim 13, wherein the feed forward correction circuit conveys a portion of the amplified error signal to the control circuit and wherein the control circuit comprises:

a gain and phase adjuster that receives the attenuated error signal and adjusts an amplitude and a phase of the attenuated error signal to produce an amplitude and phase adjusted attenuated error signal;

a summation junction coupled to the gain and phase adjuster that receives the amplitude and phase adjusted attenuated error signal, receives the attenuated amplified error signal, combines the amplitude and phase adjusted attenuated error signal with the attenuated amplified error signal to produce the error distortion signal;

a distortion detector coupled to the summation junction that quantifies the error distortion signal; and

a controller coupled to the distortion detector that reads the quantified error distortion signal and produces the control signal based on the quantified error distortion signal.

16. (Once Amended) The [communication device] feed forward amplifier of claim 15, wherein the control signal comprises a plurality of control signals, wherein the controller conveys a first control signal of the plurality of control signals to the gain and phase adjuster, wherein, based on the first control signal, the gain and phase adjuster adjusts an amplitude of the attenuated error signal and a phase of the attenuated error signal in order to facilitate a cancellation of an error component of the attenuated amplified error signal, and wherein the controller conveys a second control signal of the plurality of control signals to the main signal path.

17. (Once Amended) The [communication device] feed forward amplifier of claim 13, further comprising a delay circuit interposed between the gain and phase adjuster and the summation junction that introduces a timing delay into the amplitude [and] or phase adjusted portion of the error signal.

18. (Once Amended) A method for reducing distortion in a transmitter having a feed forward amplifier, wherein the feed forward amplifier amplifies an input signal to produce an amplified signal, the method comprising steps of:

sampling the input signal to produce an attenuated input signal;

sampling the amplified signal to produce an attenuated amplified signal;

combining the attenuated input signal with the attenuated amplified signal to produce an error signal;

detecting a peak power of the error signal;

producing a control signal based on the detected peak power of the error signal, wherein the control signal is capable of controlling an adjustment of an amplitude of the

input signal and a phase of the input signal [an energy of the peak power of the error signal]; and

wherein the error signal is amplified to produce an amplified error signal that comprises an error component and a distortion component and wherein, by controlling [an energy of the peak power of the error signal] an adjustment of an amplitude of the input signal and a phase of the input signal, controlling the distortion component of the amplified error signal [can be minimized by controlling an energy of the peak power of the error signal].

21. (Once Amended) [The communication device of claim 20, wherein the step of producing a control signal based on an error signal comprises] A method for reducing distortion in a transmitter having feed forward amplifier, wherein the feed forward amplifier amplifies an input signal to produce an amplified signal, the method comprising steps of:

sampling the input signal to produce an attenuated input signal;

sampling the amplified signal to produce an attenuated amplified signal;

combining the attenuated input signal with the attenuated amplified signal to produce an error signal;

sampling the error signal to produce an attenuated error signal;

amplifying the error signal to produce an amplified error signal;

sampling the amplified error signal to produce an attenuated amplified error signal;

producing an error distortion signal based on the attenuated error signal and the attenuated amplified error signal, wherein the error distortion signal comprises a distortion component of the attenuated amplified error signal;

quantifying the error distortion signal; [and]

[wherein the control circuit produces the] producing a control signal based on the quantified error distortion signal; and

adjusting an amplitude of the input signal and a phase of the input signal based on the control signal.

22. The [communication device] method of claim 21, wherein the control signal comprises a plurality of control signals, wherein the step of producing an error distortion signal comprises a step of combining the attenuated error signal with the attenuated amplified error signal to produce the error amplifier distortion signal, wherein the method further comprises a step of, prior to combining the signals and based on a first control signal of the plurality of control signals, adjusting an amplitude and a phase of the attenuated error signal in order to facilitate a cancellation of an error component of the attenuated amplified error signal, and wherein the step of adjusting an amplitude and a phase of the input signal based on the control signal comprises a step of adjusting an amplitude and a phase of the input signal based on second control signal of the plurality of control signals.

23. (Once Amended) A method for reducing distortion in a transmitter having a feed forward amplifier comprising steps of:

receiving an input signal;

amplifying the input signal to produce an amplified signal;

determining an error signal based on the input signal and the amplified signal;

amplifying the error signal to produce an amplified error signal, wherein the amplified error signal comprises an error component and a distortion component; and

producing a control signal based on the distortion component of the amplified error signal, wherein the control signal is capable of [reducing distortion in the transmitter] controlling an adjustment of of an amplitude of the input signal and a phase of the input signal and, by controlling an adjustment of the input signal, controlling the distortion component of the amplified error signal.